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# Drivers of Change: How Effective are Corporate Supply-Chain Commitments?

## Analysis of the Brazilian Beef and Soy Sectors, and the Colombian Beef and Dairy Sectors

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# Contents

# Executive Summary

**While hundreds of companies have pledged to remove deforestation from agricultural supply chains over the last decade, little information is available on the transformational impact of these commitments.** Available studies tend to focus on assessing the number and nature of commitments.[1] Research on impact of supply-chain initiatives remains incidental and scattered.[2] This study is a first step in addressing this gap and seeks to shed light on the farmer incentives to change practices to more sustainable operations as well as the link of such changes to forest-related corporate commitments. The assessment focused on the beef and soy sectors in Brazil and the beef and dairy sectors in Colombia.

**Many companies, including global agribusiness corporations and consumer goods companies, have made commitments to address deforestation in the cattle and soy sectors in Brazil and Colombia and have taken steps to implement them.** Overall, we find that:

- Commitments in the beef sector refer to general pledges to end deforestation and improve traceability, while commitments in the soy sector focus on specific approaches towards implementation such as certification and moratoria.
- Where specific implementation tools are explicitly mentioned as part of a commitment, such as certification and moratoria in the soy sector, commitments are more likely to be passed on to the producer level to achieve the desired effect.
- The Brazilian soy sector is more integrated, and financial and technical capacity barriers are less pronounced than in the beef sector which enhances the ability of companies to translate commitments into results at the producer level.
- In the beef sector, the majority of commitments have been made by upstream companies (e.g. manufacturers and retailers) in Brazil, while slaughterhouses mostly rely on sectoral agreements to address deforestation. Many companies limit their commitment or sourcing criteria to the last farm before slaughtering. The scope of these commitments fails to capture deforestation in earlier stages of production (e.g. breeding) where it is most rampant.
- None of the cattle related commitments made by multinational companies specifically refer to Colombia, which may be due to a lesser exposure of the Colombian cattle and dairy sector to international markets and - until recently - lesser NGO pressure and general awareness of the link between commodities and deforestation in Colombia compared to Brazil.
- A lack of agreed definitions and reporting formats constraints limit the ability to comprehensively assess progress in implementing and impact of corporate commitments. Moving forward, civil society initiatives such as the Accountability Framework will play an important role in providing harmonized definitions and tools to implement and monitor corporate commitments, but collaboration will be needed to ensure that the elements of the Framework are adapted to local circumstances and adoption is brought to scale.

[1] Such as Supply-Change.org, the Global Canopy's Forest 500; CDP's Forest Scorings, or the annual assessments of TFA 2020 and the New York Declaration Assessment Partners.
[2] Lambin, E.F., Gibbs, H.K., Heilmayr, R., Carlson, K.M., Fleck, L.C. et al. (2018). The role of supply-chain initiatives in reducing deforestation. *Nature Climate Change.*

**Commitments in their current state are insufficiently addressing producer barriers to sustainable production.** Producers face a number of economic and technical constraints, as well as land tenure, governance, and supply chain complexities that present barriers to their adoption of sustainable practices. In both Colombia and Brazil, the economic value of forests left standing still does not outweigh the opportunity costs of deforestation-free practices. In the cattle sector, in addition to investments in sustainable intensification being perceived as risky and lacking access to capital for investments in fertilizers, seed and infrastructure, farmers are faced with limited technical capacity and knowledge to improve pasture management. Many farmers have also not registered for tenure rights preventing them from controlling investments they make. In the beef sector, many smaller producers also lack market access, or where there is access, a lack of organization to facilitate the adoption of best practices. Company commitments in the cattle and soy sector tend to be vague and in most cases they still have to be translated into action. Implementation is slow and we found very little evidence that companies have started to address barriers that prevent farmers from transition to sustainable practices.

**Few supply-chain companies in the soy or beef sectors provide positive incentives or assistance that would help producers in the transition towards more sustainable practices**. Many corporates –in particular in Brazil- rely on disincentives, such as avoiding sourcing from blacklisted municipalities or areas covered by a moratorium, or excluding farmers that do not meet company sustainability criteria to implement their commitments. However, the effectiveness of these disincentives to address barriers to sustainable production is limited unless they are combined with appropriate incentives and delivered through strong connectivity along the supply chain and across sectors. In practice, there is limited willingness from consumers and corporates to pay for premiums, to enter into purchase commitments that are tied to improved environmental practices, or to engage in extensive technical and financial support provision. Consequently, few examples of purchase agreements and contract farming, including pre-financing of seed and other farm inputs, exist in the soy sector. The commitments that are established are mainly driven by supply concerns and can be enabled through tighter connections between producers, processors, and traders.

Overall, the impact of supply-chain efforts can be greatly enhanced by increasing the scale and scope of commitments, engaging companies that are representing a large market share of a given commodity, strengthening integration and transparency of the supply chain, and having effective public-private cooperation. More specifically, we identified the following success factors:

- Efforts that cover significant territories and a great number of producers are likely to be more effective than scattered efforts of individual companies. Commitments are more effective when they cover a large percentage of producers across production areas.
- Concentrated efforts of a large share of corporates in a supply chain are more successful than a plurality of different strategies of a limited number of actors. Efforts are easier to implement in integrated supply chains than in supply chains that are diffused and plagued by informality.
- Commitments are more likely to be implemented if they are unambiguous and linked to a particular implementation strategy. High-level and aspirational targets are more likely to stall at the level of implementation than clearly defined sourcing criteria.
- The implementation of commitments has to focus on actors that are at risk of deforestation and unsustainable behaviour. Rewarding already compliant and sustainable practices is often easier, but less effective than a strategy that engages actors at the forest frontier.

- Transparency in supply chains allows companies to trace commodities to the producer level and verify the compliance with sourcing criteria. Traceability and transparency also helps companies to identify producers in need for assistance that could be targeted through public-private extension and support.

**Effective supply-chain efforts require collective action and in particular a stronger involvement of the government to address some of the most profound barriers that producers face.** Cooperation between public agencies and private corporations can help to align incentives and disincentives, the delivery of financial and technical support, and the organization and transparency of a supply chain.

# 1 Introduction

**Given their potential influence to shift agricultural practices through sourcing decisions, supply-chain companies are important actors in addressing commodity-driven deforestation.** By pledging to eliminate deforestation in their supply chains and to stop sourcing or producing commodities that are associated with unsustainable practices, more than 470[3] companies that are active in producing, trading or processing palm oil, beef, soy or timber have already committed to addressing deforestation embedded in their supply chains. However, existing efforts are not enough and recent assessments point to a need for scaling up and strengthening company commitments.[4] As we approach the year 2020 - an important target year for most company commitments - it is timely to assess whether they have been translated into action and how they influence producer behavior.

**There remains limited understanding of when and how company commitments can motivate changes in farming and land-use practices.** The objective of this assignment is to assess to which extent existent corporate supply-chain commitments successfully motivate producers to shift from deforestation and - in the beef and dairy sectors also from inefficient practice - to more sustainable operations. To test this common assumption on corporate commitments, we conducted a systematic analysis of their ambition, scope and implementation - and analyzed if they translate into incentives and disincentives - along the different supply chain stages to drive a shift in producer behavior.

**The assessment focuses on the beef and soy sectors in Brazil and the beef and dairy sectors in Colombia.** Both countries are major hotspots of deforestation and inefficient cattle ranching is one of the most important drivers of deforestation in the region. In Brazil, soy production is another cause for the conversion of ecosystems.[5] In Colombia, cattle systems at the forest frontiers are mostly mixed systems that produce meat as a by-product of dairy operations. Brazil had the world's highest gross tree cover loss in 2016 and Colombia was among the 20 top deforesting countries.[6] Given that Brazil has received more attention from corporate supply chain efforts, the two countries also provide an opportunity for comparison between older and newer company efforts to address deforestation in their supply chains.

**The paper is structured as follows.** Chapter 2 provides essential background information on the beef and soy sectors in Brazil and beef and dairy in Colombia. Chapter 3 describes our methodology and a theory of change for corporate supply-chain commitments, providing a framework for our analysis. Chapter 4 presents the barriers that hinder farmers from adopting better practices followed by our findings on corporate commitments and key factors that drive change in producer behavior. Chapter 5 provides conclusions.

[3] Global Market Overview (2018). Retrieved from http://www.supply-change.org
[4] Lambin, E.F., Gibbs, H.K., Heilmayr, R., Carlson, K.M., Fleck, L.C. et al. (2018). The role of supply-chain initiatives in reducing deforestation. *Nature Climate Change*
[5] Henders, S. Persson, U., & Kastner, T. (2015). Trading forests: land-use change and carbon emissions embodied in production and exports of forest-risk commodities. *Environmental Research Letters*: 10(2015):125012
[6] Climate Focus analysis based on Hansen, M. C., P. V. Potapov, R. Moore, M. Hancher, S. A. Turubanova, A. Tyukavina, D. Thau, S. V. Stehman, S. J. Goetz, T. R. Loveland, A. Kommareddy, A. Egorov, L. Chini, C. O. Justice, and J. R. G. Townshend. 2013. "High-Resolution Global Maps of 21st-Century Forest Cover Change." Science 342 (15 November): 850–53. Data available online from: http://earthenginepartners.appspot.com/science-2013-global-forest.

# 2 Background

## 2.1 The Brazilian Beef Sector

**Brazil has one of the largest cattle herds in the world – 219 million heads, occupying almost one fifth (164 million hectares) of its land area in 2016.**[7] That same year, beef production generated 7% of Brazil's GDP (US$142 billion).[8] Close to 37 million cattle were slaughtered, producing more than 9 million tons of beef.[9] Despite recent scandals and economic instabilities, the industry outlook continues to point to a trajectory of growing production and exports. In the Amazon region alone, the sector provides income to more than half a million smallholders.[10]

**Most extensive cattle farms produce low yields per hectare, deliver little economic gain for farmers, and demand vast areas of land**. They require little investment and therefore provide a low risk option for farmers who lack capital and expertise in managing more resource intensive production systems. Stocking rates are low (1.33 heads per hectare)[11] and use of agricultural inputs is limited.[12] Most cattle ranchers specialize in either breeding – mainly smallholders – or in fattening, with a few that cover the full cycle. Smallholders usually do not sell directly to slaughterhouses but to other ranchers for fattening. Most producers are not organized and do not belong to associations. At the levels of processing and trading, there has been a strong trend towards vertical integration. Three companies, JBS, Minerva and Marfrig, are active both in processing and trading, and they account for roughly two-thirds of all exports.[13] In contrast, integrated production systems from breeding to fattening are rare. This makes it very difficult for buyers to trace the origin of animals beyond the last farm prior to slaughter.

**After a large decline in deforestation between 2004-15, in recent years forest and other natural vegetation loss has been rising at an alarming rate, especially in the Cerrado biome.** Extensive cattle ranching is the most important driver of deforestation and pasture degradation in Brazil. Deforestation is further reinforced by a political economy that drives demand for products and leads to shifting patterns of land uses. Due to marginal profitability, most extensive cattle systems are found where land remains comparatively cheap.[14] In suitable areas, pasture land is gradually converted into more profitable, industrialized croplands, such as soy. The reduction in deforestation has been partly attributed to a number of public policies (e.g. improved enforcement, expanded protected areas) and private initiatives (e.g. the Soy Moratorium in the Amazon regions), combined with other external factors such as declining commodity prices. The recent rise in deforestation is attributed to a shift of production into the

[7] ABIEC. (2017). Brazilian Livestock Profile Annual Report. *ABIEC, Brazilian Beef, and ApexBrasil*.
[8] ABIEC, Brazilian Beef, & ApexBrasil. (2017). *2017 Annual Report on Brazilian Livestock Profile*. Annual Report. Retrieved from http://www.newsprime.com.br/img/upload2/sumario-ingles-010217.pdf
[9] In carcass-weigh equivalent. ABIEC. (2017). Brazilian Livestock Profile Annual Report. *ABIEC, Brazilian Beef, and ApexBrasil*.
[10] IBGE. (2009). Censo Agropecuário 2006. Brasil, Grandes Regiõs e unidades da federação. Retrieved from http://bibspi.planejamento.gov.br/bitstream/handle/iditem/722/agro_2006.pdf
[11] ABIEC. (2017). Brazilian Livestock Profile Annual Report. *ABIEC, Brazilian Beef, and ApexBrasil*.
[12] Strassburg, B.B.N, Latawiec, A.E., Barioni, L.G. et al. (2014). When enough should be enough: Improving the use of current agricultural lands could meet production demands and spare natural habitats in Brazil. *Global Environmental Change, 28*, 84-97;
Latawiec, A.E., Strassburg, B.B.N., Valentim, J.F., Ramos, F., & Alves-Pinto, H.N. (2014). Intensification of cattle ranching production systems: socioeconomic and environmental synergies and risks in Brazil. *Animal, 8*, 1255-1263;
Pacheco, P., & Poccard-Chapuius, R. (2012). The Complex Evolution of Cattle Ranching Development Amid Market Integration and Policy Shifts in the Brazilian Amazon. *Annals of the Asociation of American Geographers*.
[13] Climate Focus analysis based on Trase
[14] Strassburg, B.B.N, Latawiec, A.E., Barioni, L.G., Nobre, C.A., Silva, V.P., et al. (2014). When enough should be enough: Improving the use of current agricultural lands could meet production demands and spare natural habitats in Brazil. *Global Environmental Change, 28*, 84-97;

Cerrado and Chaco regions, and increasing political instability at the federal level, among others.

**At the core of public efforts is the Brazilian Forest Code, which obliges land developers to retain a certain share of natural vegetation land in its primary stage**. With some exceptions, users need to reserve 80% of natural vegetation in the Amazon biome and 35% in the Cerrado region. Responding to pressure from NGOs and federal prosecutors, large processors have also participated in public-private initiatives to address deforestation. Since 2009, two-thirds of all federally-inspected slaughterhouses in the Legal Amazon have signed legally binding agreements to refrain from directly purchasing cattle from farms with illegal deforestation (Termo de Adjustamento de Conducta (Conduct Adjustment Term – TAC). In addition, the four largest processors made a zero-deforestation agreement with Greenpeace (the G4 agreement). While initial reports indicated positive results[15] of these initiatives, the effectiveness of these agreements is limited as they only extend back to the very last ranch before slaughtering (i.e. 'direct' suppliers). Given the mobility of cattle at the producer stage, this narrow scope has opened the door to leakage and laundering.[16]

## 2.2 The Brazilian Soy Sector

**Brazil is the second largest producer of soy (and its by-products grain, bran and oil), producing roughly 96 million tons of soy on an area of 33 million hectares in 2016.**[17] The majority (60%) of produce is exported with a value of US$32 billion[18], while the remainder supports Brazil's livestock industry. International soy markets are likely to grow, especially to meet the demand for feed from emerging economies. In contrast to beef, soy production in Brazil is highly mechanized and profitable, with limited potential for yield improvements. More than half of the soy farms are small-scale (10-50 hectares), mainly in the Southern regions of the country, but large farms (>500 hectare) are responsible for 61% of the total production.[19] The soy supply chain is relatively concentrated, in particular at the stage of processing and trading. While there is variation between regions, compared to the cattle sector, farmers and producers in the soy sector are more engaged and have benefited from technological development in terms of inputs, services and funding.

**Until the mid-2000s soy was a large driver of deforestation in the Brazilian Amazon,**[20] **but public and private initiatives have almost stopped forest clearance associated with soy in the Amazon.** As a result of pressure from retailers and NGOs, major traders signed a voluntary agreement, the Soy Moratorium, in which they commit to not purchase soy from farmers that cleared land for soy cultivation or that used land that had been deforested for soy after July 2006. Research indicates that the large majority of soy farmers comply with the Soy Moratorium, but there are indications that some have cleared land for other purposes (other crops and cattle) and did not comply with the Forest Code.[21] Soy-driven deforestation has shifted from the Amazon to the Cerrado biome and in particular the Matopiba region where deforestation rates increased in the last decade.[22] Faced with pressure from several Brazilian NGOs and

[15] Gibbs, H., Munger, J., L'Roe, J., Barreto, R., Pereira, R., et al. (2016). Did Ranchers and Slaughterhouses Respond to Zero-Deforestation agreements in the Brazilian Amazon? *Conservation Letters* 9(1), 32–42.
[16] Gibbs, H., Munger, J., L'Roe, J., Barreto, R., Pereira, R., et al. (2016). Did Ranchers and Slaughterhouses Respond to Zero-Deforestation agreements in the Brazilian Amazon? *Conservation Letters* 9(1), 32–42.
[17] Climate Focus calculations based on FAOSTAT
[18] Abiove. Soybean complex statistics. Projection for 2018. Retrieved from http://www.abiove.com.br/site/index.php?page=statistics&area=MTAtMi0x
[19] IBGE. (2009). Censo Agropecuário 2006. Brasil, Grandes Regiõs e unidades da federação. Retrieved from http://bibspi.planejamento.gov.br/bitstream/handle/iditem/722/agro_2006.pdf
[20] Gibbs, H. K., Rausch, L., Munger J., Schelly, I., Morton, D.C., Noojipady, P., et al. (2015). Brazil's soy moratorium. *Science*, 347(6220): 377–378.
[21] Gibbs, H. K., Rausch, L., Munger J., Schelly, I., Morton, D.C., Noojipady, P., et al. (2015). Brazil's soy moratorium. *Science*, 347(6220): 377–378.
[22] Piatto, M., & de Souza, I. (2016). 10-Years of Soy Moratorium in the Amazon: History, impacts and expansion into Cerrado areas. Piracicaba, SP: Imaflora

organizations, a number of global companies agreed to the Cerrado Manifesto in September 2017. Under the manifesto, 23 global companies purchasing beef and soy from the Cerrado committed to halting vegetation loss in the biome. Since then, the number of signatories has increased to 62 companies.[23]

## 2.3 The Colombian Beef and Dairy Sectors

**Colombia has a cattle herd of 23 million heads producing about 905 thousand tons of beef and 6.8 million liters of milk per year.**[24] The industry contributes 2% of national GDP and about 700 thousand direct jobs.[25] Growth has remained relatively flat in recent decades and almost the entirety of production is consumed domestically.[26] However, the Colombian government has ambitions to develop the export market, although significant investments would be required to improve capacity and quality. Of more than half a million farms, the large majority are small-scale (<50 hectares),[27] and cattle (beef and milk) provides an important source of income for smallholders. Larger operations (>1000 hectares) are fewer in numbers but occupy more than 73% of the Colombian rural area.[28] About a quarter of Colombian agricultural producers based in rural areas are organized in sectoral or community associations;[29] the large majority lack market access.

**Production is characterized by a lack of investment in fertilizer, replanting, rotation or restoration of pastures.** Stocking rates are low (0.6 heads per hectare on average). More professionalized and intensified fattening operations are located closer to markets. Slaughtering age of the average beef animal is four years, higher than in other major beef producers in South America,[30] and dairy productivity is low. The cattle sector is disintegrated and highly informal, which limits efficiency, market access and quality of production. Most slaughterhouses merely provide slaughtering services to cattle owners and are not involved in meat processing or marketing. However, there are efforts by the Colombian government to regulate the market, which demonstrate signs of impact.[31] As a result of stricter enforcement of sanitary regulations, nearly 70% of slaughterhouses in Colombia have closed operations because they did not meet health standards.

**In Colombia, the cattle sector is the main driver of deforestation and pasture degradation.** The Peace Agreement has led to a rapid development of forest-risk activities due to previously dangerous forest areas now becoming accessible. In 2016 alone, 178 thousand hectares of forests were cleared and largely replaced by pasture land.[32] Similar to Brazil, extensive cattle grazing presents an efficient way of securing access to undeveloped lands, especially in areas that are now safe for development following the disarming of groups like the FARC in forest-rich regions of the country. Often, deforestation is driven by illicit crops (coca) and cattle ranching provides an option to secure and legalize tenure.[33] Land grabbing due to armed conflict, along with illegal actors and drug trafficking, further complicates the dynamics at the forest frontier.

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[23] Gross, A.S. (2018, March 29). Cerrado Manifesto could curb deforestation, but needs support: experts. *Mongabay,* retrieved from https://news.mongabay.com/2018/03/cerrado-manifesto-could-curb-deforestation-but-needs-support-experts/
[24] FEDEGAN. (2018). Producción, retrieved from http://www.fedegan.org.co/estadisticas/produccion-0
[25] MADS (2016). Implementación política para mejorar la competitividad del sector lácteo nacional.
[26] FEDEGAN. (2011). Situación Actual y perspectivas de la producción de carne de res.
[27] Colombian Agricultural Institute. (2017). National Livestock Census – 2017. Retrieved from https://www.ica.gov.co/Areas/Pecuaria/Servicios/Epidemiologia-Veterinaria/Censos-2016/Censo-2017.aspx
[28] DANE. (2016). Uso, cobertura y tenencia del suelo. *3er Censo Nacional Agropecuario 2014*. Retrieved from https://www.dane.gov.co/files/CensoAgropecuario/entrega-definitiva/Boletin-1-Uso-del-suelo/1-Presentacion.pdf
[29] DANE. (2016) 3er Censo Nacional Agropecuario 2014. Retrieved from https://www.dane.gov.co/files/images/foros/foro-de-entrega-de-resultados-y-cierre-3-censo-nacional-agropecuario/CNATomo2-Resultados.pdf
[30] FEDEGAN. (2006). Plan Estratégico de la Ganadería Colombiana 2019.
[31] INVIMA. (2017). Mejoras en las condiciones sanitarias de la carne.
[32] IDEAM (2017). Sistema de Monitoreo de Bosques y Carbono – SMByC.
[33] Nelson, N. & Durschinger, L. (2015). Supporting Zero-Deforestation Cattle in Colombia. USAID-supported Forest Carbon, Markets and Communities Program. Washington, DC, USA.

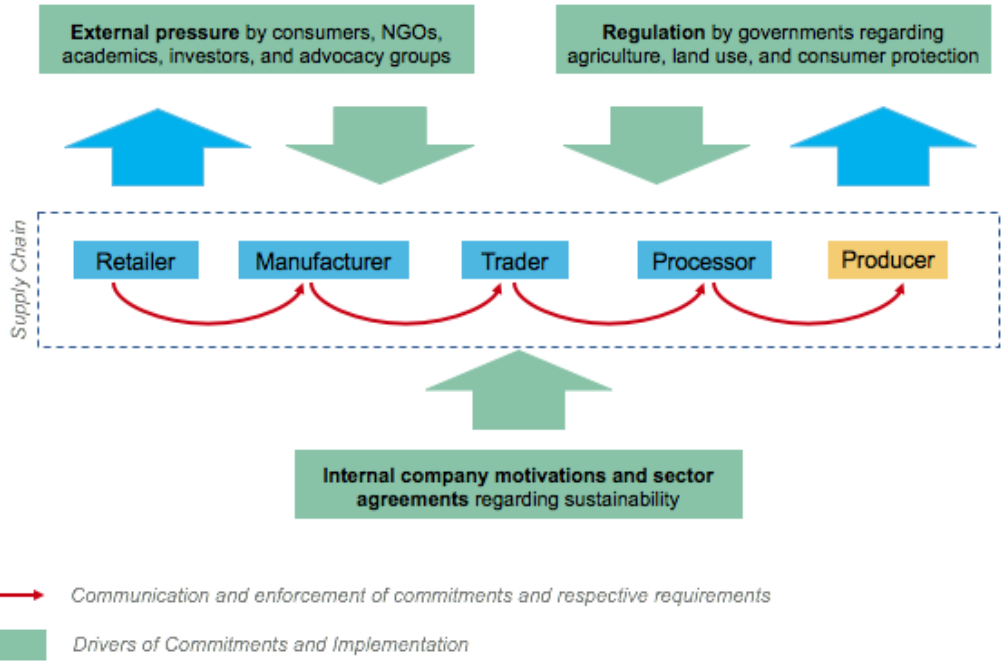
**Colombia has been working to develop high-level policies, such as the Amazon Vision, that set ambitious goals for addressing deforestation.** The government has made a commitment under Amazon Vision to reach zero-net-deforestation in the Amazon region by 2020 and the National Development Plan to reduce gross deforestation to 90,000 hectares per year. Even though Colombia's nationally determined contribution (NDC) does not include a specific forest target, it acknowledges that about half (58%) of national emissions stem from the LULUCF sector and pledges to reduce GHG emissions by 20% or 30% with international support against a business-as-usual scenario. The NDC also pledges to increase the coverage of new protected areas by more than 2.5 million hectares. With support from Germany, Norway and the United Kingdom through the REDD+ Early Movers Programme, over US$370 million in results-based finance has been committed to achieving zero deforestation in the Colombian Amazon by 2020.[34] In 2018, a "TFA 2020 Colombia Alliance" was announced to further promote a zero-deforestation agricultural commodities agenda. The Alliance includes the Colombian government, companies such as Poligrow, Nestlé, or McDonald's, and organizations like WWF, TNC, Solidaridad, GGGI and Proforest, among others.

[34] An initial US$120 million was committed by the countries in 2015 (see: Joint Declaration of Intent (2015). Available at: https://bit.ly/2wrjypa), and up to another US$250 million by Norway in 2017 (See: Minambiente (2017). Gobierno de Noruega extiende cooperación ambiental a Colombia. Available at: http://www.minambiente.gov.co/index.php/noticias/3751-gobierno-de-noruega-extiende-cooperacion-ambiental-a-colombia).

# 3 Methodology

**As a framework for this study, we developed a theory of change for corporate supply chains to shift the behavior of producers towards more efficient and low deforestation practices.** An overview of this theory is presented in Figures 1 and 2 below. External pressure by civil society and advocacy groups, government regulation, and internal factors such as company culture, supply and market access concerns, drive companies to announce commitments (Figure 1).

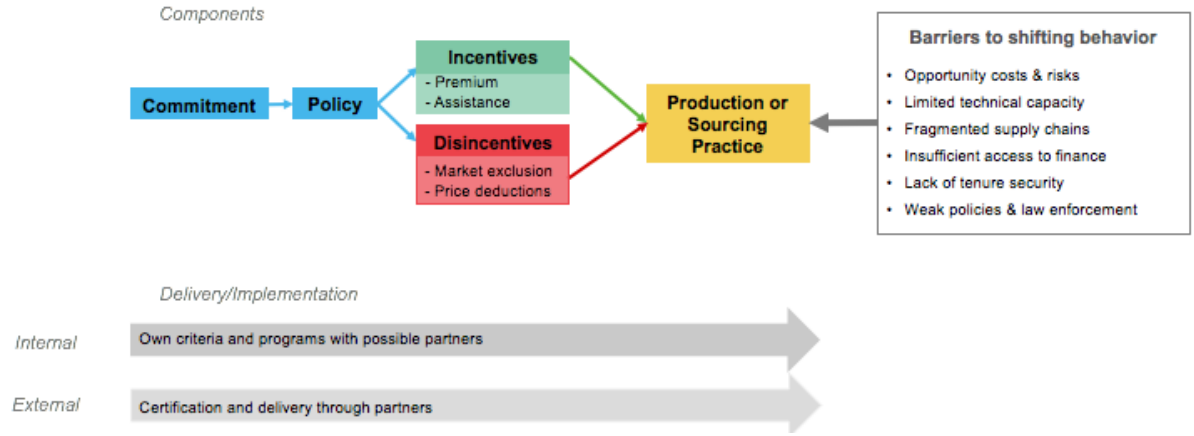
**Figure 1: Theory of Change**




**If implemented, commitments are translated into policies[35] that provide incentives and disincentives to upstream counterparts thereby impacting respective sourcing or production practices.** Policies serve internal and external communication and may be defined by each company individually or may be tied to sector-wide agreements. Incentives, disincentives, and conditions put in place by corporates are defined externally by certification standards and sector agreements, or internally according to company preferences (Figure 2). Incentives and disincentives that may be put in place for upstream counterparts alter the conditions under which producers determine their behavior; incentives intend to shift the balance in favor of a particular production practice by making it more attractive or accessible, while disincentives intend to shift the balance away from undesirable production practices through sanctions or market exclusion. Barriers to shifting behavior including market conditions and policy environment can impact the effectiveness of incentives and disincentives.

[35] Lambin, E.F., Gibbs, H.K., Heilmayr, R., Carlson, K.M., Fleck, L.C. et al. (2018). The role of supply-chain initiatives in reducing deforestation. Nature Climate Change.

**Figure 2: Commitment Impact Chain**




**To validate the theory of change, we relied on a three-step approach involving a literature review and targeted interviews.**

- **As a first step**, based on the literature review and interviews with producers and supply-chain companies, we assessed and analyzed the barriers that producers face in shifting to sustainable, zero-deforestation production.
- **As a second step**, we conducted a background review of the number of commitments, their scope and implementation.
- **As a third step**, we conducted interviews to assess the range of policies, incentives, and disincentives used in corporate supply-chain efforts and whether they affect the decision-making of producers. Interviews also captured information on the sector and policy context in which the companies operate, and the degree to which they manage to remove barriers and impact producer behavior toward sustainable, zero-deforestation production.

**Our literature review examined academic journals and grey literature that either assessed the opportunities, incentives, or effectiveness of sustainable supply chains or the implementation of sustainable policies and approaches in cattle and soy.** These studies often include a discussion of challenges and limitations, but few studies focused entirely on barriers to sustainable practices. Many studies were also lacking specific regional and context-specific considerations. The geographies captured by many of these studies did, however, fall within our study countries, allowing us to draw out insights and assumptions to develop country-relevant interview questions.

**As such, interviews were used to supplement the literature where we found information to be sparse and expanding where we encountered limitations in the scope of the available research.** Interviews were also used to collect general background information and validate or disprove existing assumptions. Interviews were guided by these pre-determined questions to collect a systematic baseline level of information but left open for discussion.

**Interviews were structured to assess how producers or other value chain actors are motivated to shift their production or sourcing behavior.** Potential interviewees were contacted through Climate Focus' and Imaflora's existing networks in Brazil and Colombia that yielded a total of 31 structured interviews with producers (17), processors (2), traders (2), manufacturers (1), retailers (2), and sector experts and associations (7), conducted between February and March 2018. We utilized a standardized questionnaire for upstream and downstream actors that was designed according to the main components of the previously developed theory of change and includes questions relating to:

1. The type of actor according to value chain position, main economic activities and production systems, membership in any applicable associations, economic conditions, investment plans, and location;
2. The nature of relationships with upstream and downstream value chain actors, including the conditions and criteria under which products are bought or sold;
3. The application of certification standards and adherence to applicable regulation;
4. The availability of incentives/disincentives, technical, and financial support mechanisms through the value chain, public institutions, and NGOs;
5. The main barriers to producing or sourcing sustainably and shifting behavior.

**The assessment of corporate commitments relied on information that was explicitly stated in commitments, company documents or other public documents.** The approach for this analysis built on the work of the New York Declaration on Forests Assessment Partners, specifically the progress assessment of Goal 2, which calls for supporting the private sector in addressing deforestation from agricultural commodity production.[36] This assessment was based on a review of publicly available information. Companies with commitments in the relevant commodities were identified based on their profiles on the *Supply Change initiative* website. We used a key word search to identify their activities in the two target geographies. Public reports were obtained from company websites and the CDP disclosure platform.[37]

**The study is considered an initial attempt at investigating the causal relationship between corporate commitments, producer behavior, and land use change as well as their enabling conditions. As a result, we encountered a range of limitations that should be considered in future research.** The main limitations include:

- Most information relating to commitments and implementation progress is self-reported by companies, tends to be patchy, and is not always up-to-date. As a result, it is difficult to assess the accuracy and completeness of information and judge the quality of implementation efforts.
- Variability in terminology and definitions used by companies in their commitments greatly reduced the ability to directly compare commitments and assess them systematically. Much of the information is vague and lacks a clear description of the means and the scope of implementation, e.g. it is unclear if activities cover all operations and regions or if they are in a pilot stage or geographically limited.
- The public and academic interest in sustainable supply chains and corporate commitments has greatly increased the demand for interviews with companies, experts, and producers which tends to reduce the response rate for interview requests and has limited the number of interviews that we were able to conduct. While the number of processor, trader, manufacturer, and retailer interviews was limited, information regarding their activities is at least to some degree available publicly and the study provides extensive coverage of the producer – and least frequently studied – perspective.
- The study was limited in terms or duration, resources, and scope. As a result, the study is considered a snapshot of the evolving conditions that affect producer behavior in the particular geographies and commodities based on mostly qualitative analysis of limited public information and interviews. The findings provide strong indications regarding the extent to which commitments affect producer behavior but should not be viewed as fully representative of the respective sectors and countries, nor should they necessarily be translated to other regions or commodities which are facing distinct conditions. Future studies may focus on expanding the geographic, sector, or temporal scope of this study or more rigorously investigate particular conditions discussed therein.

[36] Climate Focus. (2017). New York Declaration on Forests Progress Assessment: Goal 2 Update.
[37] See https://data.cdp.net/

# 4 Findings

## 4.1 Barriers to Shifting Producer Behavior

**Several barriers prevent producers from shifting from unsustainable towards efficient and deforestation-free practices.** Common barriers include economic and technical constraints at the farm level as well as overarching challenges relating to land tenure, governance, and complexities in the supply chain that impair producers' market access and bargaining position:

***1. Opportunity costs and risks associated with shifting behavior.*** At least in the short term, unsustainable practices can be economically more attractive than deforestation-free and sustainable production. Both in Colombia and Brazil, deforestation presents a cheap way to acquire new land. Even though in both countries vast areas of deforested and marginally used land are available for development, forest areas and their clearing for agriculture may still be more attractive due to other factors, such as land prices, a lack of law enforcement or the investment required to cultivate degraded and already deforested land. The decision to keep forest standing that could be legally cleared is therefore often perceived as a lost opportunity. In the cattle sector, investments in farm improvement, including in sustainable intensification, offer long-term returns[38] but are perceived as risky in the absence of technical capacity and adequate financing.

***2. Limited technical capacity in the cattle sector.*** Intensified production aimed at increasing stocking density and engaging in alternative management systems requires technical capacity. Many farmers lack specialized knowledge and skills to improve pasture management.[39] In Brazil, a lack of knowledge and understanding of new technologies and management practices reinforces producer insecurities for new investments.[40] A recent study found that the largest barrier to sustainable practices was indeed related to capacity and labor.[41] Colombian beef and dairy producers face similar issues.[42] In comparison, soy producers are more professionalized. As a seasonal crop, soy is less forgiving to poor management. A failed harvest can see producers go bankrupt in a single season, a fact that tends to instill a higher level of production planning and professionalization.

***3. Fragmented supply chains and lack of market access.*** Producers, especially in Colombia where value chains are less developed, face limited access to processing facilities and are generally impaired by the lack of infrastructure in rural areas. The lack of producers' association is an additional barrier that reduces bargaining power access to technical assistance. As a result, investment in improved farm management can be more costly and risky to producers, preventing them from shifting behavior. In Brazil, smaller producers are often excluded from formal supply chains due to a lack of

[38] Latawiec A.E., Strassburg, B.B.N.., Silva, D., Alves-Pinto, H.N., Feltran-Barbieri, R. et al. (2017) Improving land management in Brazil: A perspective from producers. *Agriculture, Ecosystems and Environment*, 240, 276-286.
[39] Calle Z., & Murgueitio, E. (2008). El aliso o cerezo: un gran aliado para la ganadería sostenible en las montañas colombianas. Revista Carta FEDEGAN 106: 58-64.
[40] Garcia, E., Ramos Filho, F.S.V., Mallmann, G.M., & Fonseca, F. (2017). Costs, benefits and challenges of sustainable livestock intensification in a major deforestation frontier in the Brazilian Amazon. *Sustainability*, 9(1), 158.;
Newton, P., Gomez, A.E.A., Jung, S., Kelly, T., de Araújo Mendes, T., et al. (2016). Overcoming barriers to low carbon agriculture and forest restoration in Brazil: The Rural Stustentável project. *World Development Perspectives*, 4,5-7.
[41] Latawiec A.E., Strassburg, B.B.N., Silva, D., Alves-Pinto, H.N., Feltran-Barbieri, R. et al. (2017). Improving land management in Brazil: A perspective from producers. *Agriculture, Ecosystems and Environment*, 240: 276-286;
Latawiec, A.E., Strassburg, B.B.N.., Valentim, J., Ramos, F., & Alves-Pinto, H.N. (2014). Intensification of cattle ranching production systems: socioeconomic and environmental synergies and risks in Brazil. *Animal*, 8(8), 1255-1263.
[42] Calle, Z., Murgueitio, E., Chará, J., Molina, C.H., Zuluaga, A.F. & Calle, A. (2013). A Strategy for Scaling-Up Intensive Silvopastoral Systems in Colombia, Journal of Sustainable Forestry, 32:7, 677-693.
Ruiz, L.R., Stefan, B., Muñoz, Quiceno, J.J., Enciso, K., Gutierrez Solies, J.F., et al. (2016). Inhibiting factors and promotion strategies for increasing adoption levels of improved forages in cattle production.

compliance with environmental legislation.[43] In Colombia, smaller farmers in post-conflict areas continue to lack access to both national and international markets.

***4. Lack of suitable finance targeted at sustainable practices in the beef and dairy sectors.*** Farm improvements require investments in fertilizers, seeds, and infrastructure, which depend on significant amounts of capital. Initial investments also require technical assistance to adapt farming systems to local conditions. These measures are costly and technically complex.[44] Many farmers lack access to funds to invest in farm improvements and pay for technical assistance in the absence of company support. According to a 2017 study of Brazilian producers, access to capital and lack of funds was the second largest barrier to their implementing sustainable practices.[45] It continues to be difficult for producers to obtain credit for sustainable investments, despite the existence of several rural loan programs for small to large producers. Brazil's Low-Carbon Agriculture Program of Brazil ("ABC Plan") has made significant volumes of finance available but uptake has been low. While the program offers credit for rural enterprises who comply with environmental and sustainability requirements, it does not explicitly prohibit deforestation.[46] Furthermore, these programs do not cover costs of compliance with the Forest Code. The financial risk is too great for farmers to undertake on their own, and producers are hesitant to invest without land tenure and environmental regulation. Other forms of incentives may parallel credits, but these are similarly difficult to implement. This includes possible tax reductions, rural insurance, and other compensations. Beyond the public sector, financial institutions often do not include conditions for deforestation-free commodities or sustainability criteria, often lending without forest-risk safeguards in place.[47] In Colombia, credit lines targeting sustainable farm renovations are in the pilot stage and corresponding financial instruments are not yet widely available. Commercial credit through financial institutions often does not match the cash flow profile for farm renovation and typically comes with unaffordable interest rates. While financing for inputs is available in the soy value chain, similar credit lines are rare in the cattle sector, and almost absent for farm renovation. At the same time, agriculture producers receive a significant amount of domestic public support – in Brazil alone nearly US$10.5 billion and US$14.3 billion in beef and soy, respectively – which is not tied to any safeguards or provisions related to deforestation.[48]

***5. Lack of tenure security.*** Without land tenure, in Colombia and some regions of Brazil, farmers are unable to obtain financing and lack security over their investments. This is especially the case for smallholders who often operate without registered, long-term tenure rights. While property rights remain an issue in both Colombia and Brazil, quantifying the problem areas is difficult as proper rural registries are limited. In Colombia, 43% of farms with more than 2,000 hectares lack land titles for parts or all of their land. For smaller farms with less than five hectares, the average share was - at 70% - even higher.[49]

[43] IPAM. (2012). Brazil`s "Low Carbon agriculture" Program: Barriers to Implementation.
[44] Chará, J., Rivera, J., Barahona, R. Murgueitio, E., Deblitz, C., et al. (2017). Intensive silvopastoral systems: economics and contribution to climate change mitigation and public policies. *Integrating Landscapes: Agroforestry for Biodiversity Conservation and Food Sovereignty*, 395-416.
[45] Latawiec A.E., Strassburg, B.B.N., Silva, D., Alves-Pinto, H.N., Feltran-Barbieri, R. et al. (2017). Improving land management in Brazil: A perspective from producers. *Agriculture, Ecosystems and Environment*, 240: 276-286; Latawiec, A.E., Strassburg, B.B.N.., Valentim, J., Ramos, F. Alves-Pinto, H.N. (2014). Intensification of cattle ranching production systems: socioeconomic and environmental synergies and risks in Brazil. *Animal*, 8(8), 1255-1263.
[46] Climate Focus. (2017). Progress on the New York Declaration on Forests: Finance for Forests-Goals 8 and 9. Assessment Report. *Prepared by Climate Focus in cooperation with the New York Declaration on Forest Assessment Partners*.
[47] Climate Focus. (2017). Progress on the New York Declaration on Forests: Finance for Forests-Goals 8 and 9. Assessment Report. *Prepared by Climate Focus in cooperation with the New York Declaration on Forest Assessment Partners*.
[48] See for example: McFarland, W., Whitley, S, & Kissinger, G. (2015). Subsidies to key commodities driving forest loss. Implications for private climate finance. ODI Working Paper.
[49] OXFAM. (2017). Radiografía de la desigualdad. Lo que nos dice el último censo agropecuario sobre la distribución de la tierra en Colombia.

***6. Weak policies and law enforcement.*** While policies may be in place to incentivize or disincentivize producers to adopt better practices, governments often lack the capacity and leverage to implement these measures. The delay or absence in implementation creates an insecure and risky environment for producer level investment and behavior change. The Brazilian government faces challenges in enforcing the Forest Code. Registering properties in the Rural Environmental Registry (CAR in Portuguese) [50] – a core requirement of the Forest Code – has occurred slower than planned, and where it has happened it has not necessarily translated to a reduction in illegal deforestation. Researchers instead have observed variations in the effectiveness of CAR over time and across property sizes.[51] Revisions to the code have created uncertainty and reluctance among producers to commit to new practices.[52] Brazilian producers also observe that the risk of sanctions from Forest Code violations has decreased, and the benefits of undertaking deforestation still outweigh any potential risk and costs (including potential fines).[53] Environmental agencies report that monitoring and inspecting deforestation events, even remotely, requires labor, time and investments which makes it impractical to enforce small infractions. Thus, producers continue to undertake deforestation because of immediate benefits and low risk of prosecution.[54] In Colombia, the pressure on producers to change behaviour is significantly reduced in former conflict regions where government institutions are virtually absent.

## 4.2 Corporate Commitments to End Deforestation

**Our analysis indicates that 66 soy and beef companies – including some of the largest in the world – have made forest-related commitments and have taken steps to implement them.** We do not know how much global production volume these companies control, but the commitments cover many important global agribusinesses that operate at different levels of the supply chain. The majority of commitments come from companies that operate downstream – close to the consumers and markets where environmental concerns can influence purchase decisions. In both sectors, most companies formulate an explicit goal to end or reduce deforestation, or to use sustainable commodity production. In the following, we provide more detail on the individual sectors and supply chains. The analysis is limited by a lack of information on the scope and implementation of commitments.

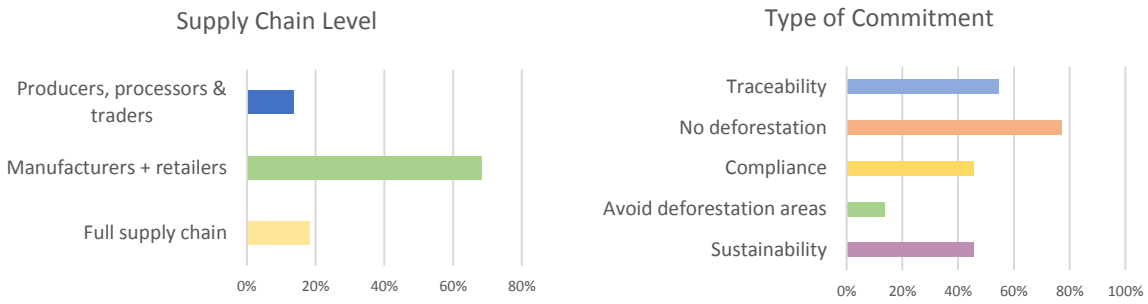
### 4.2.1 Beef in Brazil and Beef and Dairy in Colombia

**We identified 22 companies with supply-chain commitments that source from at least one of the two target geographies.** Most companies with commitments operate downstream, as manufacturers or retailers (Figure 3), but the group also includes the three largest beef processors and traders in Brazil. Although we do not know their market share, these are among the largest in the world by volume. While the meat processors have signed the TACs, few of the manufacturers have joined these agreements. All of these companies purchase beef from Brazil but only three from Colombia. Only two companies have exposure to the dairy sector.

[50] In Brazil, the implementation of the rural environmental registry (In Portuguese: Cadastro Ambiental Rural, CAR), which maps the border of all private land and permanent preservation areas and legal reserves by linking deforestation data with properties and property owners to create accountability is an essential part of the implementation of the forest code.
[51] Azevedo, A.A. Rajao, R., Costa, M.A., Stabile, M.C., Macedo, M.N., dos Reis, T.N. et al. (2017). Limits of Brazil`s Forest Code as a means to end illegal deforestation. *Proceedings of the National Academy of Sciences*, 114(29): 7653–7658.
[52] Alves-Pinto, H.N., Netwon, P., & Pinto, L. (2013). Certifying sustainability: opportunities and challenges for the cattle supply chain in Brazil.
[53] Azevedo, A.A., Stabile, M.C., & Reis, T.N. (2015). Commodity production in Brazil: Combining zero deforestation and zero illegality. *Elementa Science Anthropocene*, 3.
[54] Azevedo, A.A, Rajão, R., Costa, M.A., Stabile, M.C., Macedo, M.N. et al. (2017) Limits of Brazil`s Forest Code as a means to end illegal deforestation. *Proceedings of the National Academy of Sciences*, 114(29), 7653-7658.

**Where they refer to a target date, most companies have set commitments for 2020 and beyond**, though a small number had 2017 targets on which little progress has been reported. Some commitments are not timebound.

**Figure 3: Companies active in Brazil or Colombia with forest-related commitments by supply-chain level and commitment types in the beef and dairy sector (dairy was assessed for Colombia only). Total: 22 companies.**




**Most commitments have a goal to stop deforestation but many add important qualifiers, such as limiting the scope to the last direct supplier[55] or targeting zero *net* deforestation.** Others refer to general sustainability or traceability goals, or pledge to comply with the law and public-private agreements (Figure 2). Most assessed companies have made commitments to end deforestation in relation to their supply chains, some stating a general zero-deforestation or zero-net-deforestation goal, while others define more specific targets (e.g. including not only deforestation but also forest degradation) or specific concepts (e.g. the protection of "high-conservation value" (HCV) lands). A few beef companies specifically limit their commitments to the monitoring of direct suppliers (e.g. excluding deforestation at earlier stages of production from their commitment and responsibility). More than half of the companies also committed to traceability, either as a general goal or specifying the targeted level (e.g. slaughterhouses, farms, suppliers). Many companies embed their more specific deforestation goals in general goals of sustainability or corporate responsibility. Almost half of companies also reaffirmed their commitment to legality (some in general terms and some to the Brazilian Forest Code), while others pledged to comply with TACs.

**Only half of the reviewed companies specify approaches or strategies to implement their commitments.** Even fewer companies provide clear and detailed information on the activities that they pursue to fulfill their commitments. Those that do use a wide range of strategies that vary in specificity – some vaguely refer to "certified sustainable beef" while others reference the G4 or the TACs. Processors and traders were more likely to have concrete activities defined to ensure sourcing in compliance with their commitments, such as avoiding blacklisted municipalities[56], consulting property records of suppliers to check against public records, and developing internal policies. Some retailers organize third-party audits of their suppliers to ensure compliance with purchase criteria. A small group of companies implement their commitments by sourcing beef from non-tropical countries (e.g. from Australia).

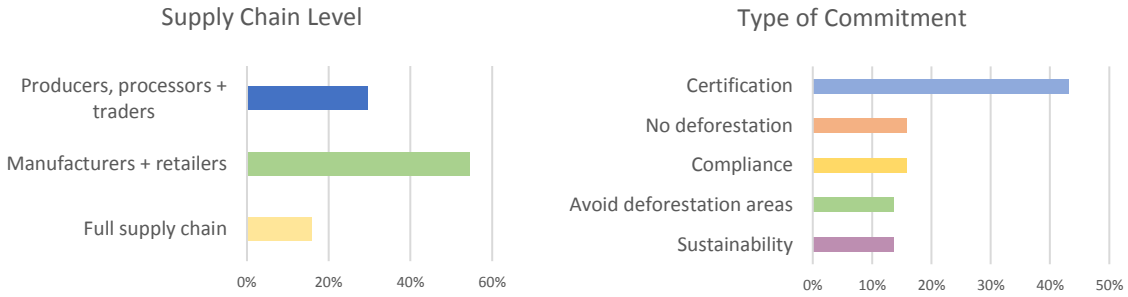
**One-third of companies report that they are working with suppliers to ensure traceability and compliance.** Such support programs include capacity building programs for farmers to improve production practices and working with suppliers to improve mapping and monitoring of the supply chain.

[55] This is particularly true for major meat processing companies, including those that signed the G4 agreement, and that do not monitor indirect suppliers. See JBS here (point 3 of the conclusions); Minerva here (p.6); and Marfrig (p. 10) here.
[56] Since 2009, the Brazilian Institute for the Environment and Renewable Natural Resources (IBAMA) has been publicly blacklisting municipalities with illegal deforestation.

### 4.2.2 Soy in Brazil

**We identified 44 companies that source soy from Brazil and made forest-related commitments, including some of the largest traders and retailers in the world.** As in the beef and dairy sector, we found the largest group of companies in the downstream part of the value chain (Figure 4). While we do not know the market share of the sample group, the group includes major processors and manufacturers; five of them account for more than half of Brazilian soy exports in 2015.[57]

**Figure 4: Companies active in Brazil with forest-related commitments by supply chain level and commitment types in the soy sector. Total: 44 companies.**




**Similar to the beef and dairy sectors, many companies do not have time-bound commitments, and in other cases time targets have already lapsed.** Less than one-third of soy-sourcing companies have targets for 2020 or after. A quarter of companies had commitments for prior to 2020 that have not or are unlikely to be met.

**Almost half of companies (43%) commit to sourcing certified soy (typically 100% Roundtable for Sustainable Soy (RTRS) certification).** Compared to the beef and dairy sectors, soy companies published more detail on their implementation activities and sourcing criteria. However, few companies had internal sustainability principles that were not embedded in a certification scheme. Other companies pledge compliance with the Soy Moratorium and the Forest Code or commit to avoiding sourcing from blacklisted municipalities. Soy companies report more engagement with their suppliers than in the beef and dairy sectors; most companies reported having support programs for suppliers. A small share also chose to avoid risks by excluding Brazil from its sourcing regions.

## 4.3 Drivers to Shift Producer Behavior

### 4.3.1 Incentives

**Producers interviewed for our study do not report receiving higher prices for sustainable practices, but for quality considerations.** Retailers confirm that there is limited willingness from consumers to pay a higher price for sustainable products, and supply-chain companies are not ready to pay premiums that they cannot pass on to consumers**.** For RTRS certification companies report very limited demand from consumers and high transaction costs for meeting requirements. As a result, one of the traders reported that, while they do encourage the adoption of RTRS certification in their supply chain, they would not pay any premiums this year for certified soy. Consumer-facing companies face strong competition, ultimately risking market shares, if they were to increase retail prices for a product that is mostly invisible to consumers. Soy producers and traders also reported on price differentiations around non-genetically modified soy (e.g. for the European market). In the beef sector, some Brazilian and Colombian cattle producers were offered premiums for quality rather than environmental standards and depend largely on the bargaining power of producers (e.g. due to a shortage of quality calf supply). In the Colombian dairy sector, milk prices are regulated

[57] Climate Focus analysis based on Trase data.

by the Ministry of Agriculture but frequently undermined by middlemen in remote regions who pay farmers below official prices. There were no reports of premiums for environmental performance in the Colombian dairy sector, except for one retailer who has started a new pilot project to provide technical assistance to smallholder dairy farmers.

**According to our analysis, purchase contracts are rarely used to push for better environmental practices, except for a few examples in the soy sector.** Downstream actors (processors, traders, retailers, and exporters) commonly maintain long-term contractual relationships but, with few exceptions, interviews did not show that they were used as incentive tools for driving change in supplier or producer behavior. While limited, we found the most concrete examples for purchase contracts in the soy sector. Several processors and producers utilize contract farming agreements to push for certified or non-genetically modified soy, in exchange for pre-financing of seed and other farm inputs. Long-term supplier relationships were also reported in beef and dairy, but we did not find evidence of existing contracts being used as means to convince farmers to change practices. As long as markets for non-sustainable products continue to exist, farmers' benefits of remaining independent may outweigh the security of offtake agreements. As such, producers are unlikely to commit to a single buyer on an exclusive basis unless additional incentives are provided. Retailers increasingly include environmental performance criteria in supplier arrangements but they appear to be used mostly as disincentives, excluding farmers that do not meet these criteria.

**Very few supply chain companies provide technical assistance to farmers, and neither governments nor civil society actors are doing enough to close the training and knowledge gap.** Our interviews indicate assistance as one of the biggest needs for producers to adopt more sustainable practices. Most companies do not regard capacity building and training as their responsibility and point towards the need for public assistance. Supply-chain companies were only willing to invest in assistance if there was a concrete business case, such as to secure supply (e.g. in contract farming) or the opportunity to sell farm inputs. We found little evidence of companies providing support to small-scale producers in the cattle sector, with few exceptions related to pilot programs. In Brazil, state-level extension programs (EMATER) provide support to small farmers. However, efforts often lack coordination and extension officers provide insufficient guidance on the implementation of national policies.[58] Larger soy and beef producers are expected to contract technical assistance themselves, which they confirm to occasionally do. In the Colombian dairy sector, processors face high risks of low quality and constrained supply, in particular in the dry season and in structurally weaker regions. As a result, a few companies have started assistance programs, but struggle with high costs and therefore look for public funding. We found limited evidence of support programs that were implemented in partnership with the public sector or civil society.

**Supply chain companies are not addressing the financial barriers that farmers encounter for adopting improved practices.** Despite widespread awareness of the need for finance, current levels of support are vastly insufficient to make an impact at the producer level. As a result, most producers interviewed use their own resources to finance farm improvements. Except for contract farming in soy, where companies provided short-term and seasonal finance to producers, we only found a few examples of companies supporting farmers in gaining access to finance. There are examples of companies collaborating with public and private financial institutions to enhance credit availability to select farmers' groups, but these programs have not reached scale. The company Alquería in Colombia applies such a model and has been seeking public and private finance to be extended to smallholders. Like technical assistance provision,

[58] C.Sette, J.Ekboir (2013), An overview over rural extension in Brazil: the current situation. ILAC working paper 14, March 2013, accessible here.

financing through companies represents additional costs and risks for them. Few are willing to take this on, unless stable access to quality supply is a major concern.

### 4.3.2 Disincentives

**Interviews suggest that market exclusion - restricting company sourcing to compliant producers or other upstream counterparts - is by far the most common strategy employed by supply chain companies. If employed in isolation, however, this strategy appears inadequate to shift behavior and reduce deforestation at scale.** Examples for exclusion include sourcing strategies based on the TACs or Soy Moratorium that restrict access to non-compliant suppliers. Market exclusion is perceived as effective and, if implemented at scale, can send important market signals. It is a relatively cost-effective strategy for supply-chain companies to address their reputational risks, as it does not require direct engagement with producers or investments in costly support programs. Yet evidence from the cattle sector indicates that unless combined with incentive strategies and inclusion mechanisms targeting producers at the forest frontier, exclusion fails to change sector-wide producer behavior and has a limited effect on deforestation. Farmers must still obtain CAR registration and are responsible for monitoring costs, which may be beyond their capacity. The TACs failed, for example, to capture deforestation from indirect suppliers and cannot change behavior of producers that need financial or technical support. The Soy Moratorium has successfully limited deforestation for soy in the Brazilian Amazon, but it has not stopped land owners from deforestation for other commodities. This highlights the limitations of agreements that are restricted to a single commodity and geography in reducing deforestation overall.

**Another type of disincentive, price deductions, did not play a role and was not perceived as an appropriate instrument to reduce deforestation or other unsustainable practices.**

### 4.3.3 Key Success Factors

**Supply-chain efforts have to be implemented at scale and across all forest-risk areas.** Some of the largest companies in the world are among the group that made pledges to protect forest. Many are active in Brazil, but only a few are also active in Colombia. In addition, a large share of production is consumed domestically or exported to countries (e.g. China) with limited sensitivity to issues of deforestation and sustainability. Regional and local efforts leave an open door to leakage, as they engage only part of the commodity production or segments of the supply chain.[59] The Soy Moratorium was effective because it covered almost all soy producers in the Amazon. However, the limited regional scope led to a displacement of soy production to other regions, and the focus on one commodity indirectly favored other deforestation drivers. While more difficult to achieve, multi-sector agreements (e.g. covering soy, cattle, and other agricultural commodities) could provide a solution to the issue of inter-commodity leakage.

**Commitments generate impact if they can pull a significant share or producers or suppliers.** Such concentration may occur at different levels of the supply chain (e.g. processor, trader, exporter, retailer) and in different geographies within a country. Market integration can stifle competition and may not be regarded as favorable for producers but it can send strong market signals to suppliers and off-takers. Yet, concentration and commitment coverage at one stage of the value chain does not necessarily result in impact at another stage, as evident in the Brazilian cattle sector. While TAC agreements

[59] Lambin, E.F., Gibbs, H.K., Heilmayr, R., Carlson, K.M., Fleck, L.C. et al. (2018). The role of supply-chain initiatives in reducing deforestation. Nature Climate Change

cover the vast majority of slaughtering capacity (>70%), the number of producers reached is estimated at only 17%.[60]

**Commitments can only be implemented and monitored if they are translated into clear and transparent requirements addressed at deforestation.** High-level and aspirational pledges have to be translated into company policies that define how a company will achieve its goals. Strategies include certification standards, clear sourcing criteria or other agreements that set relevant conditions. Our analysis shows that in the beef and dairy sectors, so far only half of companies explicitly communicate particular implementation strategies. A larger share did for soy, where commitments are more specific in defining how commitments are to be achieved. This is not necessarily surprising as specificity in soy is comparatively easier to achieve by referring to certification. This tool is not readily available in the cattle sector, where moratoria or tested public-private agreements such as the G4 or the TACs are the main strategies for implementation.

**Implementation of commitments through pilot programs, incentives, and disincentives need to target those producers that are engaged in or are at the risk of engaging in deforestation**. Our findings suggest that companies mostly select producers that have either already adopted better practices or are at a low risk of being associated with deforestation. This approach may reward past achievements, but fails to address current deforestation risk. There also appears to be a mismatch between where assistance is most needed and where it is provided. For example, we find that most intensification programs in cattle are focused on the fattening farms and less on the breeding farms which are located closer to the forest frontier and where major improvements are required to feed a growing number of efficient fattening operations while reducing deforestation. Unless breeding operations are professionalized to increase sustainable supply and reliable traceability mechanisms are put in place, intensification in the fattening stage may indirectly drive further deforestation by breeders.

**Companies need to be able to track performance and enforce their policies.** This is essential for companies to reward good and punish bad performance. Traceability and transparency also help companies to identify producers in need for assistance that could be targeted through public-private extension and support. In Brazil, larger beef retailers manage traceability systems, although they still rely on public information and reports from slaughterhouses. In contrast, only one soy company referred to traceability in its commitment. Research groups are piloting traceability solutions that combine land records with animal transport documentation, which could provide a more effective means of supply verification. Many slaughterhouses are starting to recognize the opportunity and business case for enhanced transparency, such as in terms of market access. The Brazilian experience provides various lessons for Colombia, where the ability to trace cattle and dairy and deforestation exposure remain virtually inexistent, except for cases where retailers have direct relationships with fully integrated producers.

**The ability of companies to reach producers, enforce policy, and deliver incentives, depends strongly on their connectivity along the supply chain**. In the cattle sector, downstream companies have no direct link to the production level. In the soy value chain in contrast, we find at least some level of integration from primary production through processing and trading. The level of vertical integration and the smaller number of producers in the soy value chain may be one of the enabling factors of the Soy Moratorium.

**Collaboration with the public sector and civil society is crucial to ensure consistency of messages to producers and to leverage respective strengths for**

[60] Barreto, P., Ritaumaria, P., Brandao, A., Baima, S. (2017). Will meatpacking plants help halt deforestation in the Amazon? Belém, PA: Imazon.

**producer support.** We found public and private efforts on traceability in Brazil to be mutually reinforcing: the ability of companies to rely on a system such as the environmental registry for producers has resulted in an accelerated uptake and thus enhanced transparency overall. Successful examples of collaboration have been reported in other aspects of cattle management, including the vaccinations against foot and mouth disease.[61] Clear market signals that vaccination efforts were required to enable beef exports, a common interest by the public and private sector as well as producers and civil society, served as an enabling factor of successful implementation. The private sector not only backed but strongly lobbied for public intervention and provision of funding for the program. If such efforts were replicated for deforestation issues, they would provide a strong push towards the timely achievement of forest-related commitments.

[61] Barreto, P., Pereira, R., Brandao Jr., B., & Baima, S. (2017). Will Meat-Packing Plants Help Halt Deforestation in the Amazon? *Imazon and Instituto Centro de Vida.*

# 5 Conclusions

**Commitments in their current number, scope, and level of implementation insufficiently address producer barriers to shifting to deforestation-free and sustainable production**. Producers interviewed for this study reported hardly any influence on their practices and our review does not provide evidence for positive behavior changes at scale. Given the focus of companies on exclusions strategies and a consistent lack of positive incentives, the producer behavior that is most notable is adaptation, in many cases attempting to work around exclusion rules. Despite some success in Brazil, the most common strategies (e.g. the Soy Moratorium, the TACs) for implementation require additional incentives and a stronger role of the public sector to reach producers at scale.

**It is essential to scale up commitments across commodities and geographies. Scale is essential to minimize the risk that sustainability problems are solved in one farm while shifted to another.** This applies to all levels of the supply chain, from producers to off-takers up to markets for sustainable and deforestation-free products. For high-level pledges, the numbers point to major gaps in commitment coverage in various parts of the value chain and markets (e.g. domestic demand). Commitments from large, formal companies often do not reach the producer level and are not passed on where commodities are distributed through informal channels, which is often the case in the Colombian dairy market.

**Perhaps more urgent than increasing the number of commitments, is the strengthening of existing commitments from vague, high-level goals to transparent and harmonized action plans.** Companies need to clearly define activities, scope and resources allocated to these efforts. The current landscape of activities is as fragmented as the value chains they intend to improve, which makes coordination between actors difficult and sends unclear messages to producers. The Accountability Framework Initiative, which is working to create a standardized set of terms and guidelines for supply chain commitments, can provide the basis for improved transparency and accountability. In addition, civil society and academia can continue their efforts to tackle some of the technical and logistical challenges for implementation (e.g. with tracing indirect cattle suppliers), and to facilitate accountability of individual companies (e.g. through the transparency platform Trase).

**Supply chain companies cannot succeed on their own.** Collective action is required, and in particular a stronger involvement of the government will be essential to address some of the most profound barriers that producers face (e.g. basic governance at the forest frontier, the lack of tenure security or enforcement, the need for support, improved connectivity of the supply chain). In Colombia, the government has integrated sustainable rural development as one of the main components of the Peace Agreement. While the government still needs to establish basic institutions in the areas that were formerly controlled by the FARC, it has also adopted several policies to promote the cattle sector. As the supply chain is moving towards professionalization (e.g. in 2017 alone, the number of authorized meatpackers increased from zero to 70), there is an opportunity to integrate sustainability concerns and to ensure transparency as these structures are established. In Brazil, the current political situation makes it unlikely that there will be strengthened government action. It is important to note that government involvement depends on private sector demand, and the rising emergence of jurisdictional approaches to addressing commodity-driven supply chains provide an important signal for continued collaboration in this area.[62]

[62] Climate Focus. (2017). Progress on the New York Declaration on Forests: Finance for Forests-Goals 8 and 9. Assessment Report. *Prepared by Climate Focus in cooperation with the New York Declaration on Forest Assessment Partners*.

**Companies have an opportunity to influence public policies and to partner with governments, both to promote improved enforcement and to design incentive programs for producers.** Our analysis indicates a clear gap for technical and financial assistance for sustainable production practices. Supply chain companies do not see producer support as their responsibility but focus on the use of disincentives to implement their commitments. Public programs for sustainable agriculture support are still rare or fail to integrate deforestation concerns (e.g. through safeguards). There is an opportunity for companies to partner with governments, to establish tailored incentive programs for deforestation-free programs. Civil society and academia can help design innovative mechanisms that help deliver support effectively and cost-efficiently. This is also an opportunity for international donors to live up to their financing pledges to address deforestation. Companies can also use their influence on the government to lobby for improved enforcement of deforestation issues. A concrete example for interventions can be found in the beef sector where reports indicate that the government obstructs transparency in the registration and permitting of indirect cattle movements.[63]

**The delivery of finance has to be streamlined and be made available at scale.** We found innovative examples of investment by impact investors, state, and private banks, included but not limited to pilots for sustainable cattle and income diversification. Programs include investments by the Brazilian government (e.g. the ABC program), FINAGRO in Colombia, and investments in Brazilian cattle intensification operator PECSA. Interviewers suggest that these efforts need to be scaled up and out to reach smaller and remote producers (e.g. at the forest frontier). Supply chain companies maintain close connections with financial institutions, including for agricultural input financing, often subsidized by fiscal incentives. Yet, interviews did not point to widespread efforts of companies engaging the financial sector to extend credit to producers for sustainable land use. We see an opportunity both to increase the utilization of environmental criteria for extending credit, as well as the development of partnerships between companies, the public sector, and financial institutions to reduce investment risk as a basis for enabling credit flow. Companies can send market signals and use their relationships to engage the financial sector. Governments have the power to shift the balance towards sustainable investments by reviewing and adjusting subsidies and fiscal incentives.

[63] Barreto, P., Pereira, R., & Baima, S. (2017). Will Meat-Packing Plants Help Halt Deforestation in the Amazon. Belém, PA: *Imazon; Cuiabá: Instituto Centro da Vida*.

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## Companies assessed

We reviewed the sustainability reports and, where available, public responses to CDP's forest questionnaire (companies in **bold**) for the following companies with operations in the beef and/or dairy sectors in Brazil and Colombia (22) and soy sector in Brazil (44):

| Beef and/or dairy | Soy |
|---|---|
| **Arcos Dorados** | AB Agri |
| **Barry Callebaut** | Adecoagro |
| **British Airways** | **ADM** |
| **Carrefour** | Agrex do Brasil |
| **Ferrero** | **Ahold Delhaize** |
| **GPA** | **Amaggi** |
| **Group Casino** | Arla |
| **Grupo JD** | Axfood |
| **J Sainsbury plc** | Bayer |
| **JBS** | **Bunge** |
| **Jeronimo Martins** | **Cargill** |
| **Marfrig Group** | **Carrefour** |
| **Mars** | Coca Cola |
| **Mataboi** | Cofco Agri |
| **McDonalds** | **Colgate-Palmolive** |
| **Minerva Foods** | **Danone** |
| **Nestle** | Denofa |
| **OSI** | FAPCEN |
| **Tesco** | Grupo JD |
| **Unilever** | **J Sainsbury plc** |
| **Walmart** | **JBS** |
| **Woolworths Holdings Limited** | Kellogg's |
| | Kesko Group |
| | Lantmannen |
| | **Loreal** |
| | Luis Dreyfus |
| | **M&S** |
| | **Marfrig Group** |
| | **Mars** |
| | **McCormick** |
| | **McDonalds** |
| | Morrisons |
| | **Nestle Oil** |
| | **Nestle** |
| | Nutreco |
| | OSI |
| | Rewe Group |
| | **SLC Agricola** |
| | Terra Santa |
| | **Tesco** |
| | **Unilever** |
| | Van Rooi Group |
| | Waitrose |
| | Walmart |